

WHAT IS CLAIMED IS:

1. An augmented reality presentation apparatus for superimposing a virtual object in a real space, characterized by comprising:

5 augmented reality presentation means for  
superimposing the virtual object viewed from a player's  
viewpoint position in the real space viewed from said  
player's viewpoint position;

the first video sensing means for sensing a video  
10 of the real space viewed from a first viewpoint  
position which differ from said player's viewpoint  
position;

the first video generation means for generating a video of the virtual object viewed from said first viewpoint position;

### WATER-LEVEL POSITION,

the first video composition means for compositing an augmented reality video viewed from said first viewpoint position on the basis of said videos of the real space and the virtual object viewed from said first viewpoint position.

2. The apparatus according to claim 1, characterized  
in that said augmented reality presentation means  
25 further comprises:

the second video sensing means for sensing a video of the real space viewed from said player's viewpoint position;

5 the second video generation means for generating a video of the virtual object viewed from said player's viewpoint position;

the second video composition means for 10 composing an augmented reality video viewed from said player's viewpoint position on the basis of said videos of the real space and the virtual object viewed from said player's viewpoint position;

and

the display means for displaying to the player 15 the augmented reality video viewed from said player's viewpoint position.

3. The apparatus according to claim 1, characterized in that said augmented reality presentation means further comprises:

20 the second video generation means for generating a video of the virtual object viewed from said player's viewpoint position;

and

the display means for displaying to the player 25 the video of the virtual object viewed from said player's viewpoint position on a display surface

through which the player can visually see the real space.

4. The apparatus according to claim 1, characterized  
5 by further comprising information generation means for  
generating information that pertains to rendering of  
the virtual object, and

in that said first video generation means and  
said second video generation means generate videos of  
10 the virtual object using the information that pertains  
to rendering of the virtual object.

5. The apparatus according to claim 4, characterized  
in that said information generation means generates  
15 information of an outer appearance of the virtual  
object and information of a position/posture of the  
virtual object as the information that pertains to  
rendering of the virtual object.

20 6. The apparatus according to claim 1, characterized  
in that parameters of said first video sensing means  
are known, and

25 said first video generation means generates the  
video of the virtual object viewed from said first  
viewpoint position in accordance with the known  
parameters.

7. The apparatus according to claim 1, characterized in that some of parameters of said first video sensing means are variable,

5 said apparatus further comprises measurement means for measuring changes of the parameters, and

10 said first video generation means generates the video of the virtual object viewed from said first viewpoint position in accordance with the parameters measured by said measurement means.

15 8. The apparatus according to claim 7, characterized in that the parameters of said first video sensing means measured by said measurement means include at least one of a viewpoint position/posture, and zoom ratio.

20 9. The apparatus according to claim 1, characterized in that when a plurality of first video sensing means equivalent to said first video sensing means are present,

25 said apparatus further comprises selection means for receiving a plurality of videos of the real space from said first viewpoint position from the plurality of first video sensing means, and outputting a video of

the real space viewed from said first viewpoint  
position input from one selected first video sensing  
means to said first video composition means, and  
said first video composition means generates a  
5 video of the virtual object viewed from said first  
viewpoint position using parameters of the first video  
sensing means selected by said selection means.

10. An augmented reality presentation method for  
10 superimposing a virtual object in a real space,  
characterized by comprising:  
15 augmented reality presentation step of  
superimposing the virtual object viewed from a player's  
viewpoint position in the real space viewed from said  
player's viewpoint position;  
the first video sensing step of sensing a video  
of the real space viewed from a first viewpoint  
position which differ from said player's viewpoint  
position;  
20 the first video generation step of generating a  
video of the virtual object viewed from said first  
viewpoint position;  
and  
the first video composition step of compositing  
25 an augmented reality video viewed from said first  
viewpoint position on the basis of said videos of the

*Claim 10*  
real space and the virtual object viewed from said first viewpoint position.

11. The method according to claim 10, characterized in that the augmented reality presentation step further comprises:

the second video sensing step of sensing a video of the real space viewed from said player's viewpoint position;

10 the second video generation step of generating a video of the virtual object viewed from said player's viewpoint position;

15 the second video composition step of compositing an augmented reality video viewed from said player's viewpoint position on the basis of said videos of the real space and the virtual object viewed from said player's viewpoint position;  
and

20 the display step of displaying to the player the augmented reality video viewed from said player's viewpoint position.

12. The method according to claim 10, characterized in that the augmented reality presentation step further 25 comprises:

the second video generation step of generating a video of the virtual object viewed from said player's viewpoint position;

and

5 the display step of displaying to the player the video of the virtual object viewed from said player's viewpoint position on a display surface through which the player can visually see the real space.

10 13. The method according to claim 10, characterized by further comprising the information generation step of generating information that pertains to rendering of the virtual object,

and

15 in that in said first video generation step and said second video generation step, videos of the virtual object are generated using the information that pertains to rendering of the virtual object.

20 14. The method according to claim 13, characterized in that said information generation step includes the step of generating information of an outer appearance of the virtual object and information of a position/posture of the virtual object as the 25 information that pertains to rendering of the virtual object.

15. The method according to claim 10, characterized in that parameters of means for sensing said first viewpoint video are known, and

5           said first video generation step includes the step of generating the video of the virtual object viewed from said first viewpoint position in accordance with the known parameters.

10 16. The method according to claim 10, characterized in that some of parameters of means for sensing a video viewed from said first viewpoint position are variable, said method further comprises the measurement step of measuring changes of the parameters,

15       and

          said first video generation step includes the step of generating the video of the virtual object viewed from said first viewpoint position in accordance with the parameters measured in the measurement step.

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17. The method according to claim 16, characterized in that the parameters of the means for sensing a video viewed from said first viewpoint position measured in the measurement step include at least one of a viewpoint position/posture, and zoom ratio.

18. The method according to claim 10, characterized in that when a plurality of means for sensing a video viewed from said first viewpoint position are present, said method further comprises the selection step 5 of receiving a plurality of videos of the real space viewed from a first viewpoint position from the plurality of means for sensing a video viewed from said first viewpoint position, and outputting the video of the real space viewed from a first viewpoint position 10 input from one selected means for sensing a video of said first viewpoint position to means for compositing a first viewpoint video, and said first video composition step includes the step of generating a video of the virtual object viewed 15 from said first viewpoint position using parameters of the means for sensing a video viewed from a first viewpoint position selected in the selection step.

*Sus  
AP3*

19. A storage medium storing a program code for superimposing a virtual object in a real space when said program code is loaded by a computer, characterized by comprising: 20 a program code of the augmented reality presentation step of superimposing the virtual object 25 viewed from a player's viewpoint position in the real space viewed from said player' viewpoint position;

a program code of the first video sensing step of sensing a video of the real space viewed from a first viewpoint position which differ from said player's viewpoint position;

5 a program code of the first video generation step of generating a video of the virtual object viewed from said first viewpoint position;

and

10 a program code of the first video composition step of compositing an augmented reality video viewed from said first viewpoint position on the basis of said videos of the real space and the virtual object viewed from said first viewpoint position.

15 20. The medium according to claim 19, characterized in that the program code of the augmented reality presentation step further comprises:

20 a program code of the second video sensing step of sensing a video of the real space viewed from said player's viewpoint position;

a program code of the second video generation step of generating a video of the virtual object viewed from said player's viewpoint position;

25 a program code of the second video composition step of compositing an augmented reality video viewed from said player's viewpoint position on the basis of

1 said videos of the real space and the virtual object  
2 viewed from said player's viewpoint position;  
3 and

4 a program code of the display step of displaying  
5 to the player the augmented reality video viewed from  
6 said player's viewpoint position.

21. The medium according to claim 19, characterized  
22. in that the program code of the augmented reality  
23. presentation step further comprises:

24. a program code of the second video generation  
25. step of generating a video of the virtual object viewed  
26. from said player's viewpoint position;

27. and

28. 15 a program code of the display step of displaying  
29. to the player the video of the virtual object viewed  
30. from said player's viewpoint position on a display  
31. surface through which the player can visually see the  
32. real space.

33. 20

34. 22. The medium according to claim 19, characterized  
35. by further comprising a program code of the information  
36. generation step of generating information that pertains  
37. to rendering of the virtual object,

38. 25 and

in that in the program codes of said first video generation step and said second video generation step, videos of the virtual object are generated using the information that pertains to rendering of the virtual  
5 object.

23. The medium according to claim 22, characterized in that the program code of said information generation step includes the step of generating information of an  
10 outer appearance of the virtual object and information of a position/posture of the virtual object as the information that pertains to rendering of the virtual object.

15 24. The medium according to claim 19, characterized in that parameters of means for sensing said first viewpoint video are known, and

the program code of said first video generation step includes the step of generating the video of the  
20 virtual object viewed from said first viewpoint position in accordance with the known parameters.

25. The medium according to claim 19, characterized in that some of parameters of means for sensing a video viewed from said first viewpoint position are variable,

the program code of said medium further comprises  
the measurement step of measuring changes of the  
parameters,  
and

5       the program code of said first video generation  
step includes the step of generating the video of the  
virtual object viewed from said first viewpoint  
position in accordance with the parameters measured in  
the measurement step.

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26.   The medium according to claim 25, characterized  
in that the parameters of the means for sensing a video  
viewed from said first viewpoint position measured in  
the measurement step include at least one of a  
15   viewpoint position/posture, and zoom ratio.

27.   The medium according to claim 19, characterized  
in that when a plurality of means for sensing a video  
viewed from said first viewpoint position are present,  
20       said medium further comprises a program code of  
the selection step of receiving a plurality of videos  
of the real space viewed from a first viewpoint  
position from the plurality of means for sensing a  
video viewed from said first viewpoint position, and  
25       outputting the video of the real space viewed from a  
first viewpoint position input from one selected means

for sensing a video of said first viewpoint position to means for compositing a first viewpoint video, and the program code of said first video composition step includes the step of generating a video of the 5 virtual object viewed from said first viewpoint position using parameters of the means for sensing a video viewed from a first viewpoint position selected in the selection step.

10 28. The apparatus according to claim 1, characterized by further comprising printing means, in that said first video composition means outputs the augmented reality video to said printing means,

15 said printing means grabs one frame of the received video and prints out to the paper as a still image.

20 29. The method according to claim 10, characterized by further comprising printing step, in that in said first video composition step the augmented reality video is output to means for printing, in said printing step one frame of the received video is grabbed and printed out to the paper as a 25 still image.

30. The method according to claim 19, characterized by further comprising a program code of the printing step,

in that in the program codes of said first video  
5 composition step the augmented reality video is output to means for printing,

in the program codes of said printing step one frame of the received video is grabbed and printed out to the paper as a still image.

